EDM MFTA Processing

Figure 1
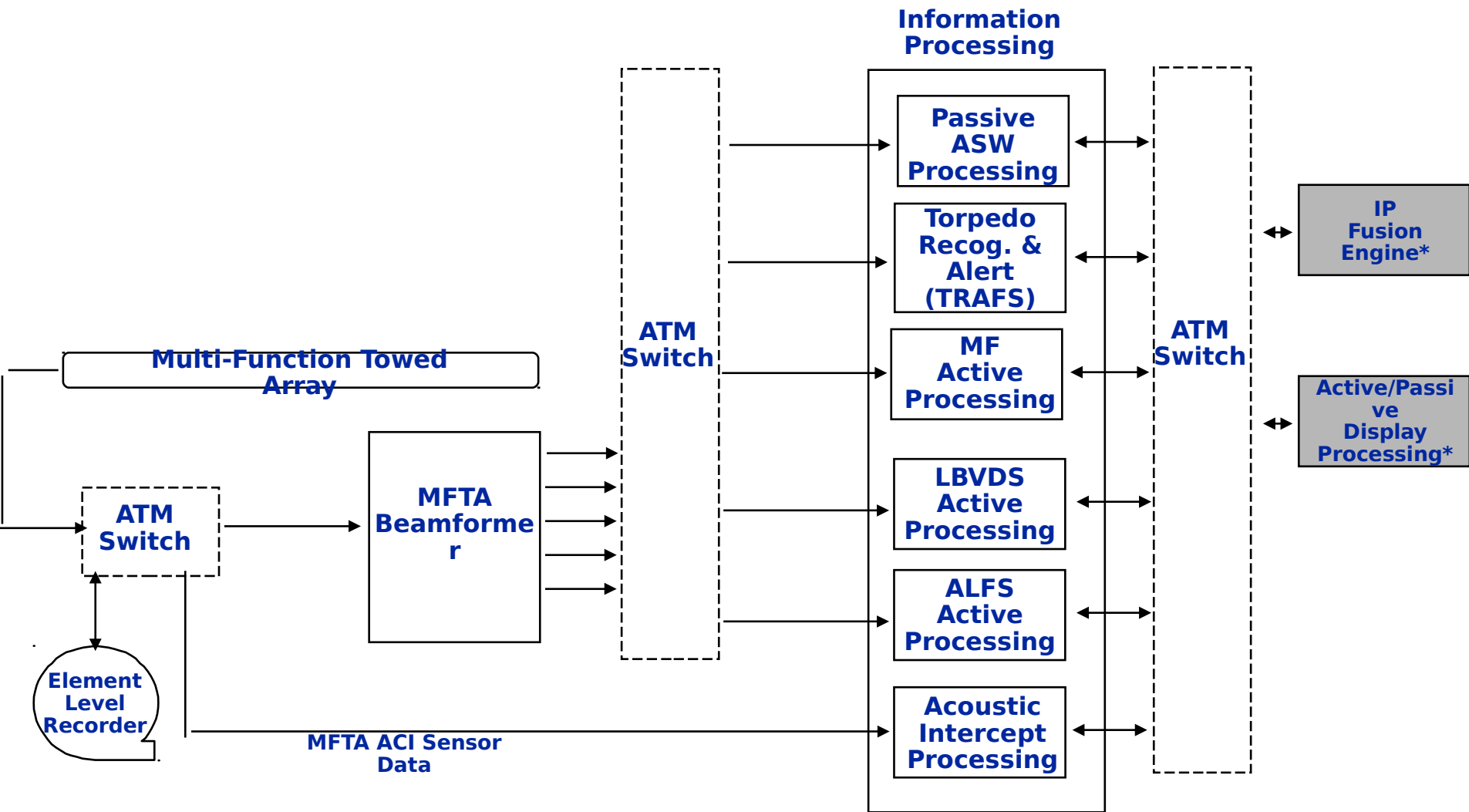
* MFTA is not integrating the information and display processing functions from multiple sensor systems.

Figure 2

Lightweight
Broadband
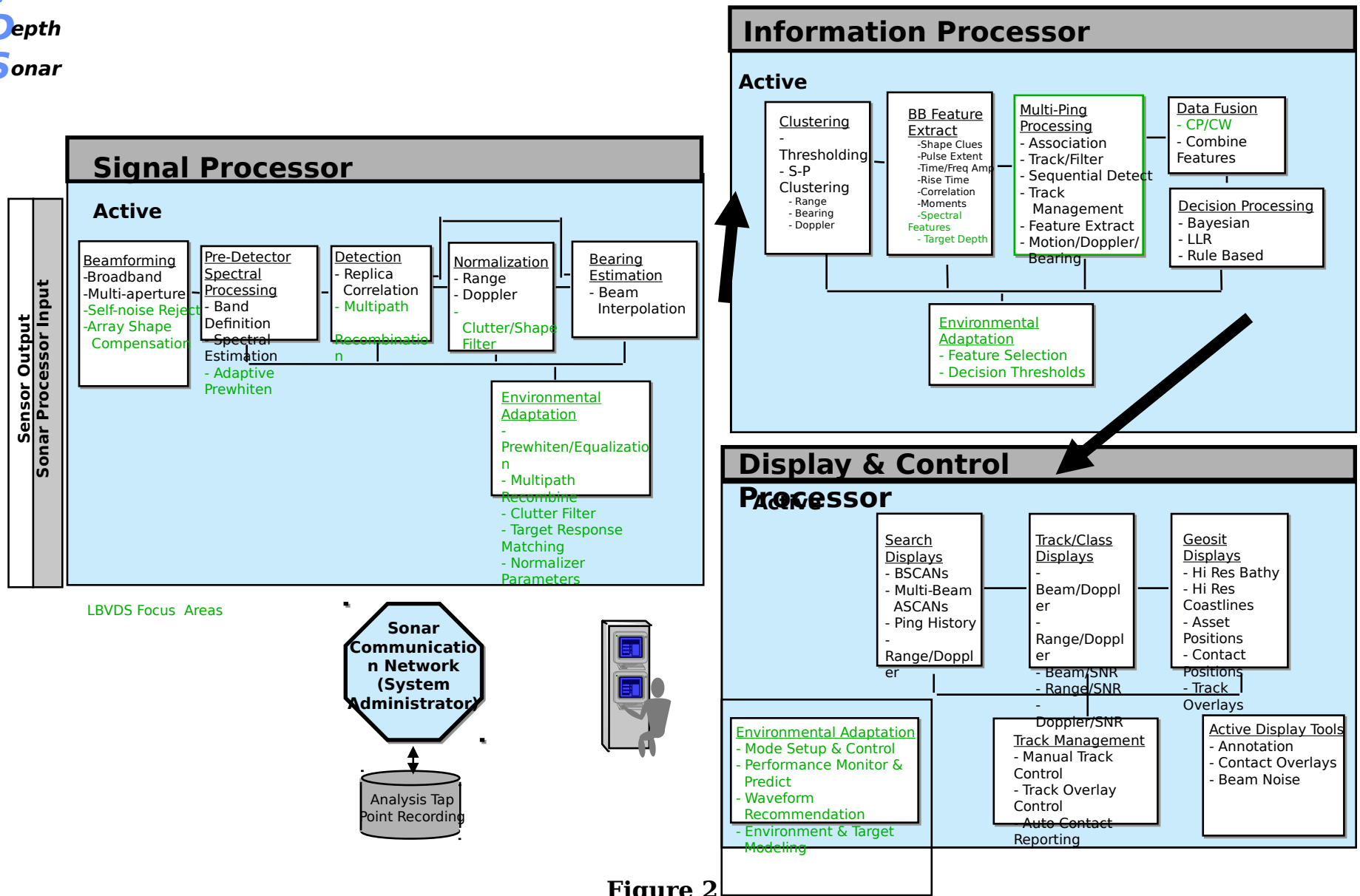*Variable*
Depth
Sonar

Baseline Rev 0 Processing Flow

Signal Processor

Active

Sensor Output / **Sonar Processor Input**

Beamforming
-Broadband
-Multi-aperture
-Self-noise Reject
-Array Shape Compensation

Pre-Detector Spectral Processing
- Band Definition
- Spectral Estimation
- Adaptive Prewhiten

Detection
- Replica Correlation
- Multipath Recombination

Normalization
- Range
- Doppler
- Clutter/Shape Filter

Bearing Estimation
- Beam Interpolation

Environmental Adaptation
- Prewhiten/Equalization
- Multipath Recombine
- Clutter Filter
- Target Response Matching
- Normalizer Parameters

LBVDS Focus Areas

Sonar Communication Network (System Administrator)

Analysis Tap Point Recording

Information Processor

Active

Clustering
-
Thresholding
- S-P Clustering
  - Range
  - Bearing
  - Doppler

BB Feature Extract
-Shape Clues
-Pulse Extent
-Time/Freq Amp
-Rise Time
-Correlation
-Moments
-Spectral Features
- Target Depth

Multi-Ping Processing
- Association
- Track/Filter
- Sequential Detect
- Track Management
- Feature Extract
- Motion/Doppler/ Bearing

Data Fusion
- CP/CW
- Combine Features

Decision Processing
- Bayesian
- LLR
- Rule Based

Environmental Adaptation
- Feature Selection
- Decision Thresholds

Display & Control Processor

Active

Search Displays
- BSCANs
- Multi-Beam ASCANs
- Ping History
-
Range/Doppler

Track/Class Displays
-
Beam/Doppler
-
Range/Doppler
- Beam/SNR
- Range/SNR
-
Doppler/SNR

Geosit Displays
- Hi Res Bathy
- Hi Res Coastlines
- Asset Positions
- Contact Positions
- Track Overlays

Environmental Adaptation
- Mode Setup & Control
- Performance Monitor & Predict
- Waveform Recommendation
- Environment & Target Modeling

Track Management
- Manual Track Control
- Track Overlay Control
- Auto Contact Reporting

Active Display Tools
- Annotation
- Contact Overlays
- Beam Noise

Echo Tracker Classifier System

Signal Processing

TARS
TB23
SWADC
53C
ALFS

Direct Blast Processing
Waveform Detection
Normalization
Fine-Bearing Estimation

Support Tools

Display

Analysis

Database

Information Processing

Clustering Feature Extraction

Single Ping Filtering

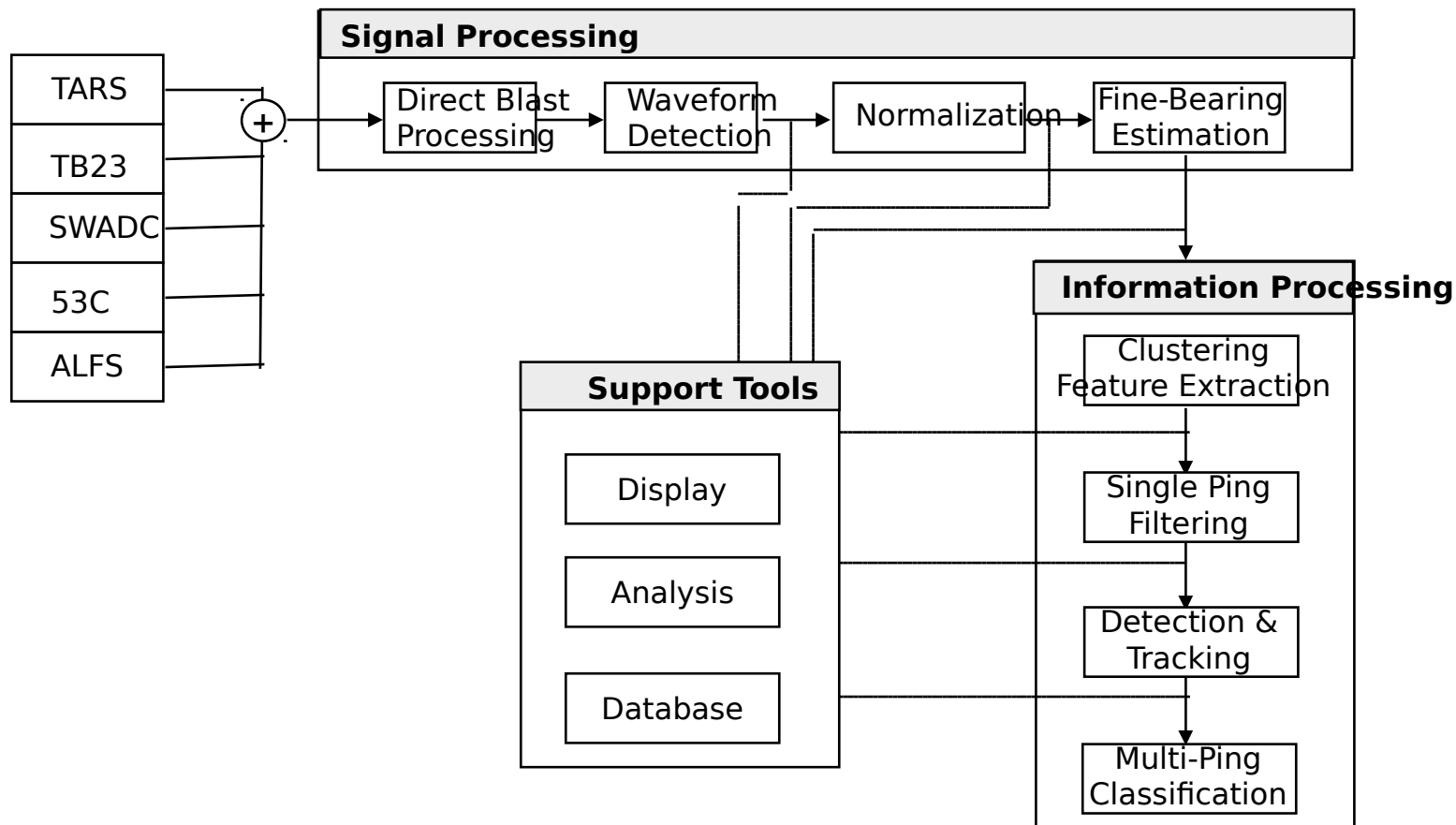Detection & Tracking

Multi-Ping Classification

Figure 3

Source: "Echo Tracker Classifier Components", Fred McMullwn, NUW